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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/919,479	07/31/2001	J. Thomas Vaughan	600.499US1	3915

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EXAMINER

VARGAS, DIXOMARA

ART UNIT PAPER NUMBER

2862

DATE MAILED: 11/21/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/919,479

Applicant(s)

VAUGHAN ET AL.

Examiner

Dixomara Vargas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-66 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-66 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the capacitors, inductance and impedance must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: #126. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "214" and "204" both are pointing to the same part, however both have been used to designate the current element and aperture. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

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*Specification*

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

*Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

6. Claims 1, 9-15, 20-60, 63 and 66 are rejected under 35 U.S.C. 102(b) as being anticipated by Srinivasan et al. (US 6,029,082).

With respect to claims 1 and 60, Srinivasan discloses an apparatus comprising: a volume coil as seen on figure 2, including a plurality of current elements (#90, #92 and #94), the volume coil having an aperture formed by removal or displacement of one or more current elements from a regular or symmetric pattern or arrangement of current elements (opening #44 on Figure 2).

7. With respect to claims 9 and 12, Srinivasan discloses an apparatus comprising: a radio frequency magnetic field unit to generate a desired magnetic field as seen on Figure 2, the radio frequency magnetic field unit having a first aperture formed at an end of the radio frequency

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magnetic field unit and a second aperture that is substantially unobstructed, wherein the first aperture is contiguous to the second aperture (Figure 2, opening #44 is sub-divided).

8. With respect to claim 10, Srinivasan discloses the second aperture has an arc having an arc length of between about  $0^{\circ}$  and about  $90^{\circ}$  (Figure 2, opening #44).

9. With respect to claim 11, Srinivasan discloses a static-field magnetic field unit having a bore, the radio frequency magnetic field unit inserted in the bore to form an imaging unit (Figure 1).

10. With respect to claim 13, Srinivasan discloses the radio frequency magnetic field unit comprises a substantially cylindrical volume having a curved arrangement of current elements with the first side aperture and the second side aperture located along the curved arrangement and the first side aperture located substantially opposite from the second side aperture (Figures 2, 4 and 6).

11. With respect to claim 14, Srinivasan discloses the first side aperture has a first width and the second side aperture has a second width that is about equal to the first width (Figures 2, 4 and 6).

12. With respect to claim 15, Srinivasan discloses a static-field magnetic field unit having a bore, the radio frequency magnetic field unit inserted in the bore to form an imaging unit (Figure 1).

13. With respect to claim 20, Srinivasan discloses a method comprising: removing two oppositely positioned current elements circuits from a first radio frequency magnetic field unit to form a second radio frequency magnetic field unit having a first aperture and a second aperture (Column 7, lines 32-45; Figures 2 and 6).

14. With respect to claim 21, Srinivasan discloses the remaining pattern or arrangement of current elements is capable of producing a desired field and the desired field is restored, compensated or otherwise effected by adjustment of currents in the plurality of current elements (Column 6, lines 11-50).

15. With respect to claim 22, Srinivasan discloses the volume coil includes a top and one or more of the regular or symmetric pattern or arrangement of current elements is removed from the top for improved access from the top and the desired field is restored (Figures 2 and 6).

16. With respect to claim 23, Srinivasan discloses the volume coil includes an open end and a closed end, the closed end being closed by a conductive plane (Figures 2 and 6).

17. With respect to claim 24, Srinivasan discloses the volume coil includes two open ends (Figures 2 and 6).

18. With respect to claim 25-28, Srinivasan discloses the volume coil capable of being used in head imaging (Figure 2).

19. With respect to claim 29, Srinivasan discloses the volume coil is capable of being used in extremity imaging (Figure 6).

20. With respect to claim 30, Srinivasan discloses the volume coil is capable of being used in foot and ankle imaging (Figure 6).

21. With respect to claim 31, Srinivasan discloses the volume coil includes an impedance and the impedance is adjusted to control current in the plurality of current elements (Column 6, lines 11-50).

22. With respect to claim 32 and 33, Srinivasan discloses the impedance is adjusted by adjusting a capacitance (Column 6, lines 11-50).

23. With respect to claims 34, 36 52 and 54, Srinivasan discloses a radio frequency conductive front end ring coupled to the plurality of current elements and a radio frequency conductive back plane coupled to the plurality of current elements (Figures 2 and 6).
24. With respect to claims 35, 37, 53 and 55, Srinivasan discloses a radio frequency conductive front end ring including a gap, the radio frequency conductive front end ring coupled to the plurality of current elements and a radio frequency conductive back plane coupled to the plurality of current elements (Figures 2 and 6).
25. With respect to claims 38 and 56, Srinivasan a slotted shield or cavity wall coupled to the plurality of radio frequency current elements (Figure 2).
26. With respect to claim 39, Srinivasan discloses a window or aperture in shield or cavity in approximate line with missing or displaced element or elements (Figure 2).
27. With respect to claim 40, Srinivasan discloses the volume coil includes an open end and a closed end, the closed end being closed by a conductive plane (Figures 2, 4 and 6).
28. With respect to claim 41, Srinivasan discloses the volume coil includes two open ends (Figures 2 and 6).
29. With respect to claim 42, Srinivasan discloses includes a top and one or more of the regular or symmetric pattern or arrangement of current elements is removed from the top for improved access from the top (Figure 2 and 6).
30. With respect to claims 43-45, Srinivasan discloses the volume coil capable of being used in head imaging (Figure 2).
31. With respect to claim 46, Srinivasan discloses the volume coil is capable of being used in body imaging (Column 7, lines 31-60).

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32. With respect to claims 47 and 48, Srinivasan discloses the volume coil is capable of being used in extremity imaging (Figure 6).

33. With respect to claim 49, Srinivasan discloses the volume coil includes an impedance and the impedance is adjusted to control current in the plurality of current elements (Column 6, lines 11-50).

34. With respect to claim 50, Srinivasan discloses the impedance is adjusted by adjusting a capacitance (Column 6, lines 11-50).

35. With respect to claim 51, Srinivasan discloses the impedance is adjusted by adjusting an inductance (Column 6, lines 11-50).

36. With respect to claim 57, Srinivasan discloses means to actively detune/retune the volume coil for use with a local receiver coil (Column 6, lines 50-62; Figure 1).

37. With respect to claims 58 and 59, Srinivasan discloses the volume coil is double tuned or multiple tuned (Column 6, lines 50-62).

38. With respect to claim 63, Srinivasan discloses one or more apertures formed on a side of the radio frequency magnetic field unit to permit access to a subject's ears (Figure 2).

39. With respect to claim 66, Srinivasan discloses the radio frequency magnetic field unit includes a top-half and a bottom-half, the top-half capable of being mechanically attached and detached to the bottom-half at the first side aperture or the second side aperture (Column 7, lines 31-60; Figure 6).

40. Claims 2-8, 16-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Srinivasan (US 6,150,816).



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41. With respect to claim 2, Srinivasan discloses an apparatus comprising: a radio frequency magnetic field unit as seen on figure 13a, including a plurality of current elements that are asymmetrically arranged (coils 1 and 2), some of which may be physically disconnected from one another and reactively coupled (Figure 13a; #C1, #C2 and #C3).

42. With respect to claim 3, Srinivasan discloses one or more current elements being physically disconnected on one or more ends (Figure 13a).

43. With respect to claim 4, Srinivasan discloses the plurality of current elements are asymmetrically arranged about a substantially cylindrical form (Figure 13a).

44. With respect to claim 5, Srinivasan discloses each of the plurality of current elements comprises a resonant current element (Column 16, lines 11-25).

45. With respect to claim 6, Srinivasan discloses a static-field magnetic field unit having a bore, the radio frequency magnetic field unit inserted in the bore to form an imaging unit (Figure 14).

46. With respect to claim 7, Srinivasan discloses each of the plurality of current elements is inductively coupled to at least one of the plurality of current elements (Column 16, lines 11-25; Figure 13a).

47. With respect to claim 8, Srinivasan discloses the each of the plurality of current elements is capacitively coupled to at least one of the plurality of current elements (Figure 13a; #C1, #C2 and #C3).

48. With respect to claims 16 and 18, Srinivasan discloses a method comprising: removing one current element from a first radio frequency magnetic field unit to form a second radio frequency magnetic field unit having an aperture (Figure 13a).

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49. With respect to claims 17 and 19, Srinivasan discloses calculating and implementing a set of currents to generate a desired magnetic field in the second radio frequency magnetic field unit (Column 16, lines 11-31; Figure 13a).

***Claim Rejections - 35 USC § 103***

50. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

51. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

52. Claims 61, 62, 64 and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Srinivasan et al. (US 6,029,082).

With respect to claims 61 and 62, Srinivasan discloses the claimed invention except for a mirror or prism mounted over the window or aperture. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Srinivasan for the purpose

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of giving the patient a less-claustrophobic environment by allowing to see outside the apparatus through a mirror.

53. With respect to claim 64, Srinivasan discloses the claimed invention except for an auditory communication device to communicate through the one or more apertures. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Srinivasan for the purpose of improving the examination of the subject by allowing the communication between the patient and the operator since the operator will be able to instruct the patient inside the bore.

54. With respect to claim 65, Srinivasan discloses the claimed invention except for the communication device provides active or passive auditory protection. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Srinivasan for the purpose of improving the examination of the subject by allowing the communication between the patient and the operator since the operator will be able to instruct the patient inside the bore.

### *Conclusion*

55. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional prior art cited at the PTO 892 discloses different configurations of a birdcage coil or volume coil.

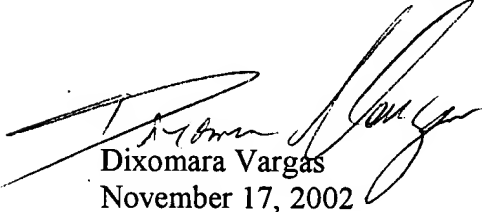
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dixomara Vargas whose telephone number is (703) 305-5705.

The examiner can normally be reached on 8:00 am. to 4:30 pm..


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (703) 305-4816. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0956.



Dixomara Vargas  
November 17, 2002



EDWARD LEFKOWITZ  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800